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REMARKS

Claims 1 - 34 are pending in the present Application. Claims 1, 22 and 28 have been amended, claims 2, 24 and 29 have been cancelled, Claims 35 - 48 have been added leaving Claims 1, 3 - 23, 25 - 28 and 30 - 48 for consideration upon entry of the present Amendment.

Claims 1, 22 and 28 have been amended to incorporate the limitation of Claim 2 respectively. Support for this amendment can at least be found in Claim 2 as originally filed.

No new matter has been introduced by these amendments or new claims.

Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

New Claims

Claims 35 - 48 have been newly added. Support for the new claims is shown in the table below:

New Claims	Support found in at least
35	Claim 1 and Claim 10 as originally filed
36 - 48	Claims 2 - 9 and 11 - 13 as originally filed

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 1, 3 - 23, 27 - 31, and 33 - 34 stand rejected under 35 U.S.C. § 103(a), as allegedly being unpatentable over U.S. Publication No. 2002/0182389 A1 to Döbler in view of U.S. Patent No. 6,060,154 to Adachi, et al. (Adachi) Applicants respectfully traverse this rejection.

In making the rejection, the Examiner has stated that "Since Döbler expresses concern about the solubility of the organic IR absorbers, it is the Examiner's position that it would have been prima facie obvious to use the boride particles of Adachi's invention to provide IR absorption to the layers while also providing improved visible light transmission and desired coloration. Such materials would not need to be dissolved in the resin but would form suitable films by dispersion of the particles" (Office Action dated 06/06/2005, page 3; Office Action dated 10/14/2005, page 2)

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The Examiner has further stated that "[T]he primary reference, Döbler teaches thermoplastic layers containing IR absorbers. By Adachi's teaching, the preferred boride compounds are useful of forming improved visible light transmission and desired coloration. One of ordinary skill in the art would expect these benefits to be inherent to the IR absorber, regardless of whether the binder resin is a thermoset or a thermoplastic." (Office Action dated 06/06/2005, page 5)

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

Claim 1 as presently amended is directed to a multilayered sheet consisting essentially of a core layer comprising a thermoplastic polymer and an IR absorbing additive; wherein the IR absorbing additive is a boride; a first cap layer comprising a thermoplastic polymer and an electromagnetic radiation absorbing additive; wherein a surface of the first cap layer is disposed upon and in intimate contact with a surface of the core layer; and a second cap layer comprising a thermoplastic polymer and an electromagnetic radiation absorbing additive; wherein the second cap layer is disposed upon and in intimate contact with a surface of the core layer opposite the surface in contact with the first cap layer.

Dobler teaches a heat absorbing system comprising at least a first layer (A) containing a ultraviolet absorber, a second layer (B) containing an organic infrared absorber and ultraviolet absorber and a third, interference layer (C) reflecting in the infrared range is disclosed. (see Abstract) The interference layer (C) disclosed by Dobler comprises at least two transparent layers (C1 and C2) with different refractive indexes that reflect infra-red radiation. In contrast, the second cap layer of the present invention comprises a single layer having a single refractive index that comprises an electromagnetic radiation absorbing additive.

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In addition, as noted by the Examiner, Döbler discloses a second layer containing an infrared absorber and an ultraviolet absorber. (see Abstract) Döbler teaches that suitable infra red absorbers are organic absorbers. (see Page 3, paragraph [0047]) Döbler further teaches that suitable infra red absorbers for use in the second layer are phthalocyanines, naphthalocyanines, metal complexes, azo dyes, anthraquinones, squaric acid derivatives, immonium dyes, perylenes, and polymethines. Döbler does not teach boride infra red additives. Thus Döbler does not teach all elements of the claimed invention.

Adachi teaches a coating solution comprising particles having an average diameter of 100 nm or less for cutting off ultraviolet radiation. (see Abstract) Adachi teaches that lanthanum boride particles can be used in the coating. (see Abstract). Adachi teaches that the coating can comprise at least one of the alkoxides of silicon, zirconium, titanium and aluminum, and partially hydrolyzed polymers of those alkoxides, or a synthetic resin as a binder. (see Abstract) Adachi teaches that the synthetic resin is a curable resin and can be cured by using ultra-violet radiation. (Col. 4, lines 34 – 40). Adachi therefore teaches that the synthetic resin is a thermosetting resin and not a thermoplastic polymer as presently claimed.

In the first instance, there is no motivation to combine with infra-red additives of Adachi with the thermoplastic resins of Döbler. As noted above, the Examiner has stated that “since Döbler expresses concern about the solubility of the organic IR absorbers, it is the Examiner’s position that it would have been *prima facie* obvious to use the boride particles of Adachi’s invention to provide IR absorption to the layers.” The Applicants respectfully disagree with the Examiner’s contention.

Dobler does not express concern about the solubility of the IR absorbers as contended by the Examiner. Dobler only states that “[I]n view of the improved solubility in thermoplastics, phthalocyanines and naphthalocyanines with bulky side groups are preferred.” (Paragraph No. [0047]) Dobler in this very limited teaching only discusses preferred IR additives. Dobler does not mention difficulties with solubility of the IR additives in the thermoplastic polymer.

Had Dobler been particularly concerned with solubility, as contended by the Examiner, it would have certainly employed more than a single sentence to discuss problems with the solubility of the IR additives in the thermoplastic polymers. The Examiner has conveniently misused this single statement by Dobler to create motivation for combining references where

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none exists, while opportunely ignoring a number of teachings in Adachi and Dobler that would have directed one of ordinary skill in the art away from combining references.

Since Adachi teaches using thermosetting resins, while Döbler in paragraphs [0054] and [0055] teaches using thermoplastic resins in the core layer, one of ordinary skill in the art upon reading Döbler and Adachi would not seek to combine the two references. Döbler teaches that the second layer containing the infra-red absorber is produced by co-extrusion or injection molding. (paragraph [0094] on page 5) Both extrusion and injection molding are melt blend processes that involve melting the thermoplastic polymer. Adachi on the other hand teaches a coating that is in the form of a solution prior to being applied to a substrate. (see Col. 2, lines 54 – 58; see Col. 3, lines 31 – 37) In the first instance, one of ordinary skill in the art desirous of adding an additive to a thermoplastic resin in a melt process would not be motivated to examine references that disclose utilizing thermosetting resins present in a solution for these additives. One of ordinary skill in the art would be well aware that in order to disperse additives in a solution, compatibilizers such as surfactants, coupling agents, and the like, are often used. Indeed upon reading Adachi one finds this to be the case.

Upon closely reading Adachi, one of ordinary skill in the art would gather that the dispersibility of the infra-red absorber in the solution is critical in order for the coating to effectively terminate UV radiation having wavelengths up to about 400 nm. Adachi stresses dispersibility by teaching that in order to improve dispersibility of the infra-red absorber, additives such as surface active agents, coupling agents, or the like, may be added to the solution. (see Col. 3, lines 31 – 37) Adachi further suggests that in order to improve dispersibility, the solution may be balled milled, sand milled or subjected to ultrasonic dispersion. (see Col. 3, lines 41 – 44)

Indeed, in each of its examples, Adachi discloses that a coupling agent or a surfactant is added to the IR additives in order to facilitate dispersion in the coating. In Examples 1, 3 and 5, a titanate coupling agent is employed, while in Examples 9 and 11 (which discuss the lanthanum boride), a silane coupling agent is employed. One of ordinary skill in the art upon reading Adachi and noting that dispersion of the lanthanum boride was never successfully achieved without the use of the coupling agents and surfactants would not have been motivated to remove the IR additives of Adachi and substitute them into the layer of Dobler without pre-treating them

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with coupling agents and/or surfactants. In other words, one of ordinary skill in the art desirous of performing extrusion on a thermoplastic resin that contains infra-red additives would not be motivated to selectively pick out an infra-red additive (without the coupling agent) from a reference that stresses the paramount importance of using a coupling agent to disperse the additive in reactive solution.

In addition, one of ordinary skill in the art upon reading Döbler and Adachi would not be motivated to combine references, since, the solutions disclosed by Adachi (especially in its examples) could never be co-extruded or injection molded into the structure of Döbler without severely damaging the structure of Döbler. In other words, extruding a thermoplastic resin along with the IR additive (of Adachi) and the associated coupling agents and solvents would result in an extremely inefficient extrusion process, not to mention the creation of voids and the like in the second layer disclosed by Döbler.

Applicants further maintain that the Examiner has used an improper standard in arriving at the rejection of the above claims under § 103, based on improper hindsight which fails to consider the totality of applicant's invention and to the totality of the cited references. More specifically the Examiner has used Applicant's disclosure to select portions of the cited references to allegedly arrive at Applicant's invention. In doing so, the Examiner has failed to consider the teachings of the references or Applicant's invention as a whole in contravention of § 103, including the disclosures of the references which teach away from Applicant's invention.

While the Examiner has contested the Applicants' claims of her use of hindsight to combine Döbler with Adachi, it is quite clear that there is very little other reason for such a combination. For example, the Examiner has selectively used a single line in Döbler (pertaining to solubility of the IR additives) to claim a pretext for "motivation to combine", while conveniently ignoring several paragraphs and pages of evidence in Adachi pertaining to dispersibility which would dissuade one of ordinary skill in the art from combining references.

For these reasons at least, the Examiner has not made a prima facie case of obviousness over Döbler in view of Adachi, and the Applicants respectfully request a withdrawal of the § 103 rejection over Döbler in view of Adachi.

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Claims 2, 24 – 25, and 32 stand rejected under 35 U.S.C. § 103(a), as allegedly being unpatentable over U.S. Publication No. 2002/0182389 A1 to Döbler in view of U.S. Patent No. 6,060,154 to Adachi, et al., and further in view of GE 2 014 513 A to La Cellophane. Applicants respectfully traverse this rejection.

La Cellophane teaches a transparent thermoplastic material comprising at least two superposed films, comprising a bottom film manufactured from a thermoplastic material resistant to UV radiation and others being made of a thermoplastic material that is opaque to infra-red radiation with a wavelength of over 8 microns. (see Abstract). La Cellophane teaches that the infra-red additive is preferably a liquid that is incorporated between the various films. (page 1, lines 67 – 74) La Cellophane teaches that this infra-red additive is glycerin (page 1, lines 115 – 116).

As noted above, there is no motivation for one of ordinary skill in the art to combine Döbler with Adachi. La Cellophane does not rectify this deficiency but instead amplifies it.

In the first instance, La Cellophane discloses that the infra-red additive is to be placed between layers instead of being incorporated into the middle layer, as presently claimed, teaches away from both the claimed invention as well as from Dobler. One of ordinary skill in the art upon reading La Cellophane and discovering that a liquid infra-red additive is coated between the layers and not incorporated into the thermoplastic resin, would not be motivated to combine references with Dobler since this implicitly teaches away from Dobler.

In addition, La Cellophane teaches that the top layer should be removed at specified intervals of time every year (see page 1, lines 54 through 65), Dobler teaches a multilayer system that does not require any such periodic modifications. One of ordinary skill in the art upon noting that the infra-red layers are to be periodically removed would not desire to combine La Cellophane with Dobler.

Applicants once again contend that this combination was made in hindsight using the present invention as a template. In order to combine Dobler with La Cellophane, one of ordinary skill in the art would have to remove the third layer (C) of Dobler (which is used for reflecting infrared radiation) and replace it with the bottom film of La Cellophane (which is used for UV absorption). Inserting the UV absorbers into the layer C of Dobler as suggested by the Examiner,

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would change the reflective capabilities of the layer thereby making it unsuitable for its intended purpose.

Further, one of ordinary skill in the art upon reading La Cellophane would also not be motivated to combine it with Adachi. La Cellophane in teaching multilayer thermoplastic structures, where the infra-red additive is placed in between the thermoplastic layers further teaches away from incorporating the additives from the solution coating of Adachi into the middle layer of Dobler. Adachi teaches a thermosetting coating that contains the infra-red additives. (see Abstract) When the thermosetting coating is cured, it provides infra-red protection to the surface upon which it is disposed. La Cellophane, on the other hand, teaches a liquid infra-red additive (glycerine) that has to be placed between layers to be preserved. The incongruence of these respective teachings would demotivate one of ordinary skill from combining references.

In view of the fact that La Cellophane does not rectify the deficiencies created when Dobler is combined with Adachi and further in view of the fact that La Cellophane teaches away from both Adachi and Dobler, Applicants respectfully request a withdrawal of the § 103 rejection over Döbler in view of Adachi and further in view of La Cellophane.

Claim 26 stands rejected under 35 U.S.C. § 103(a), as allegedly being unpatentable over Döbler in view of Adachi and further in view of Burkhardt, Gert; "Processing of Thermoplastics"; Ulmann's Encyclopedia of Industrial Chemistry, 2002 by Wiley-VCH Verlag GmbH & Co. KGaA; DOI:10.1002/14356007.120_663; Article Online Posting Date: June 15, 2000 (hereinafter "Burkhardt, et al."). (Office Action dated 06/06/2005, page 4) Applicants respectfully traverse this rejection.

In making the rejection, the Examiner has stated that "[i]t is the Examiner's position that it would have been prima facie obvious to use roll mills in Döbler's coextrusion line to combine, calibrate and cool the films. (Office Action dated 12/28/2004, page 7)

Burkhardt teaches that convention film extrusion practices include three roll mills to calibrate and cool the film. (see Figure 25) As noted above, there is no motivation to combine Döbler with Adachi. Burkhardt in teaching conventional extrusion using two or three roll mills, teaches away from Adachi since Adachi teaches the use of a solution used for a coating. The use

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of coupling agents and compatibilizers in the solution of Adachi would preclude combining it with Burkhardt. In other words, one of ordinary skill in the art desirous of performing extrusion on a thermoplastic resin that contains infra-red additives would not be motivated to selectively pick out an infra-red additive from a reference that teaches dispersing the additive in solution. One of ordinary skill in the art would therefore not be motivated to combine Burkhardt with Adachi.

Applicants respectfully request a withdrawal of the § 103 rejection over Döbler in view of Adachi and further in view of Burkhardt.

Claims 13 – 16 stand rejected under 35 U.S.C. § 103(a), as allegedly being unpatentable over Döbler in view of Adachi and further in view of U. S. Patent No. 6,136,441 to MacGregor, et al. (MacGregor) (Office Action dated Applicants respectfully traverse this rejection.

As noted above, there is no motivation to combine Dobler with Adachi. MacGregor does not rectify this deficiency. MacGregor teaches multilayer plastic composite articles comprising a thermoplastic resin substrate and at least one surface layer comprising a cycloaliphatic polyester or cycloaliphatic polyester blend which is adherent to at least one surface of the substrate. (see Abstract) In teaching multilayer plastic composite articles, MacGregor teaches melt blending which would serve as demotivation to one of ordinary skill in the art to combine it with Adachi of the same reasons that one would not be motivated to combine Adachi with Dobler. For these reasons at least, Applicants believe that the Examiner has not made a prima facie case of obviousness over Dobler in view of Adachi and further in view of MacGregor. Applicants respectfully request a withdrawal of the obviousness rejection and an allowance of the claims.

Claims 1, 3 – 23, 27 – 31, and 33 – 34 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Publication No. 2002/0182389 A1 to Döbler in view of U.S. Publication No. 2004/0028920 A1 to Fujita, et al. Applicants respectfully traverse this rejection.

As noted above, Dobler teaches a third layer C that comprises two layers C1 and C2 that have different refractive indexes. The two layers have different refractive indexes that are chosen to facilitate reflection of infra-red radiation. The present invention in contrast claims a third layer C that comprises a thermoplastic resin and an electromagnetic radiation absorbing additive. The

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third layer has only a single refractive index. Dobler therefore does not teach ~~all elements~~ of the claimed invention.

Fujita teaches a masterbatch comprising a thermoplastic resin and a hexa-boride additive represented by the formula XB_6 , wherein X is at least one selected from La, Ce, Pr, Nd, Gd, Tb, Dy, Ho, Y, Sm, Eu, Er, Tm, Yb, Lu, Sr and Ca. (see Abstract) Dobler further teaches that the masterbatch may be extruded or injection molded into sheets. (see paragraph [0012]) Fujita, however, does not teach or disclose a second cap layer having a single refractive index that comprises an electromagnetic absorbing additive, wherein the second cap layer is disposed on a core layer that also has a first cap layer disposed thereon. For this reason at least Fujita does not make up for the deficiency of Dobler.

Since the combination of Dobler with Fujita does not teach all of the claimed elements, one of ordinary skill in the art would find no motivation to combine references. Applicants respectfully request a withdrawal of the obviousness rejection and an allowance of the claimed invention over Dobler in view of Fujita.

Claims 2, 24 – 25, and 32 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Publication No. 2002/0182389 A1 to Dobler in view of U.S. Publication No. 2004/0028920 A1 to Fujita, et al., and further in view of GB 2 014 513 to La Cellophane. Applicants respectfully traverse this rejection.

As noted above, La Cellophane teaches a transparent thermoplastic material comprising at least two superposed films, comprising a bottom film manufactured from a thermoplastic material resistant to UV radiation and others being made of a thermoplastic material that is opaque to infra-red radiation with a wavelength of over 8 microns. (see Abstract) La Cellophane teaches that the infra-red additive is preferably a liquid that is incorporated between the various films. (page 1, lines 67 – 74) La Cellophane teaches that this infra-red additive is glycerin (page 1, lines 115 – 116).

As noted above, La Cellophane teaches away from Dobler. One of ordinary skill in the art upon reading La Cellophane's teaching of a liquid infra-red additive (that is disposed between

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the layers) would not be motivated to combine it with Dobler since Dobler teaches infra-red additives that are blended with a thermoplastic resin.

Applicants once again contend that this combination was made in hindsight using the present invention as a template. In order to combine Dobler with La Cellophane, one of ordinary skill in the art would have to remove the third layer (C) of Dobler and replace it with the bottom film of La Cellophane. If the UV absorbing additives were added to the layer C of Dobler as proposed by the Examiner, then the reflective properties of the third layer would be changed and the layer C would not function as intended.

Applicants respectfully request a withdrawal of the obviousness rejection over Dobler and Fujita in view of La Cellophane and an allowance of the claimed invention.

Claim 26 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Publication No. 2002/0182389 A1 to Döbler in view of U.S. Publication No. 2004/0028920 A1 to Fujita, et al., and further in view of Burkhardt, et al. Applicants respectfully traverse this rejection.

Claims 13 - 16 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Publication No. 2002/0182389 A1 to Döbler in view of U.S. Patent No. 6,060,154 to Adachi, et al. and further in view of U. S. Patent No. 6,136,441 to MacGregor, et al. Applicants respectfully traverse this rejection.

As noted above, Dobler when combined with Fujita does not teach all elements of the claimed invention. Burkhardt and MacGregor do not rectify these deficiencies. Applicants therefore respectfully request a withdrawal of the obviousness rejections over Dobler and Fujita and further in view of Burkhardt or MacGregor and an allowance of the claimed invention.

Double Patenting

Claims 1 – 34 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 – 20 and 24 – 39 of copending Application No. 11/124,223 to Dekkers, et al.

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Applicant respectfully requests that the examiner withdraw the "provisional" obviousness-type double patenting rejections until the claims are in final form and condition for allowance; until such time, there is no double patenting and no way to determine double patenting. MPEP § 804.01.I(B)(1).

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and withdrawal of the objection(s) and rejection(s) and allowance of the case are respectfully requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 50-3621.

Respectfully submitted,

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